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10/593,463	09/19/2006	Pascal Daguiet	2006_1570A	2691
513 7590 07/23/2010 WENDEROTH, LIND & PONACK, L.L.P. 1030 15th Street, N.W., Suite 400 East Washington, DC 20005-1503				
EXAMINER				
SHEVIN, MARK L				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
07/23/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/593,463

**Applicant(s)**

DAGUIER ET AL.

**Examiner**

MARK L. SHEVIN

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### Status of Claims

1. Claims 1-4, filed June 4<sup>th</sup>, 2009, are currently under examination.

### Claim Rejections - 35 USC § 103

2. **Claims 1-4** rejected under 35 U.S.C. 103(a) as being unpatentable over **Badard** (WO 03/012156 A1 – Full English Translation). The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### Badard:

Badard is drawn to a method for making a steel mechanical component of a composition as shown in the table below (Abstract and claims 1-5; p. 2, line 11 – p. 3, line 11).

Elements	Claim 1	Badard	Overlap
C	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
Mn	1.1 – 1.5	1 – 1.6	1.1 – 1.5
Si	0.8 – 1.2	0.8 – 1.5	0.8 – 1.2
S	0.01 – 0.09	0 – 0.1	0.01 – 0.09
P	trace – 0.025	0 – 0.03	trace – 0.025
Ni	trace – 0.25	0 – 0.6	trace – 0.25
Cr	1 – 1.4	0.4 – 1.6	1 – 1.4
Mo	0.10 – 0.25	0 – 0.3	0.10 – 0.25
Cu	trace – 0.3	0 – 0.3	trace – 0.3
Al	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
Nb	0.01 – 0.045	0 – 0.05 (0.02 – 0.05)	0.01 – 0.045
N	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
Bi	opt trace – 0.1	0 – 0.08	trace – 0.08
Pb	opt trace – 0.12	0 – 0.07	trace – 0.07
Te	opt trace – 0.015	0 – 0.02	trace – 0.015
Se	opt trace – 0.03	0 – 0.04	trace – 0.03
Ca	opt trace - 0.0050	0 – 0.05	trace – 0.0050
Fe	Balance	Balance	Balance

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<b>Carburizing</b> –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C
<b>Carbo-nitriding</b>			

Elements	Claim 3	Badard	Overlap
<b>C</b>	0.19 – 0.25	0.12 – 0.3	0.19 – 0.25
<b>Mn</b>	1.2 – 1.5	1 – 1.6	1.2 – 1.5
<b>Si</b>	0.85 – 1.2	0.8 – 1.5	0.85 – 1.2
<b>S</b>	0.01 – 0.09	0 – 0.1	0.01 – 0.09
<b>P</b>	trace – 0.025	0 – 0.03	trace – 0.025
<b>Ni</b>	0.08 – 0.25	0 – 0.6	0.08 – 0.25
<b>Cr</b>	1.1 – 1.4	0.4 – 1.6	1.1 – 1.4
<b>Mo</b>	0.10 – 0.25	0 – 0.3	0.10 – 0.25
<b>Cu</b>	0.06 – 0.3	0 – 0.3	0.06 – 0.3
<b>Al</b>	0.01 – 0.045	0 – 0.06 (0.008 – 0.05)	0.01 – 0.045
<b>Nb</b>	0.015 – 0.045	0 – 0.05 (0.02 – 0.05)	0.015 – 0.045
<b>N</b>	0.013 – 0.03	0.007 – 0.025	0.013 – 0.025
<b>Bi</b>	opt trace – 0.07	0 – 0.08	trace – 0.07
<b>Pb</b>	opt trace – 0.12	0 – 0.07	trace – 0.07
<b>Te</b>	opt trace – 0.010	0 – 0.02	trace – 0.010
<b>Se</b>	opt trace – 0.020	0 – 0.04	trace – 0.020
<b>Ca</b>	opt trace - 0.045	0 – 0.05	trace – 0.045
<b>Fe</b>	Balance	Balance	Balance
<b>Carburizing</b> –	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C
<b>Carbo-nitriding</b>			

Elements	Claim 4	Badard	Overlap
<b>C</b>	0.20 – 0.25	0.12 – 0.3	0.20 – 0.25
<b>Mn</b>	1.21 – 1.46	1 – 1.6	1.21 – 1.45
<b>Si</b>	0.85 – 1.10	0.8 – 1.5	0.85 – 1.10
<b>S</b>	0.01 – 0.08	0 – 0.1	0.01 – 0.08
<b>P</b>	trace – 0.020	0 – 0.03	trace – 0.020
<b>Ni</b>	0.08 – 0.20	0 – 0.6	0.08 – 0.20
<b>Cr</b>	1.10 – 1.40	0.4 – 1.6	1.10 – 1.40
<b>Mo</b>	0.11 – 0.25	0 – 0.3	0.11 – 0.25
<b>Cu</b>	0.08 – 0.3	0 – 0.3	0.08 – 0.3
<b>Al</b>	0.01 – 0.035	0 – 0.06 (0.008 – 0.05)	0.01 – 0.035
<b>Nb</b>	0.025 – 0.040	0 – 0.05 (0.02 – 0.05)	0.025 – 0.040

<b>N</b>	0.013 – 0.022	0.007 – 0.025	0.013 – 0.022
<b>Bi</b>	opt trace – 0.07	0 – 0.08	trace – 0.07
<b>Pb</b>	opt trace – 0.12	0 – 0.07	trace – 0.07
<b>Te</b>	opt trace – 0.010	0 – 0.02	trace – 0.010
<b>Se</b>	opt trace – 0.020	0 – 0.04	trace – 0.020
<b>Ca</b>	opt trace – 0.045	0 – 0.05	trace – 0.045
<b>Fe</b>	Balance	Balance	Balance
<b>Carburizing</b> – <b>Carbo-nitriding</b>	950 – 1050 °C	950 – 1050 °C	950 – 1050 °C

Al content is preferably from 0.008 – 0.05% so that the grains do not grow too large, in conjunction with preferred Nb and N contents (p. 6, para 3).

Adding Nb allows a more homogenous grain size to be obtained, which promotes homogeneity of plastic deformation in use and further minimizes this deformation (p. 6, lines 24-31).

A relatively high nitrogen content, from 70-250 ppm is recommended if carburizing or carbonitriding is carried out at elevated temperature (p. 7, lines 15-22).

Badard also describes a mechanical part obtained using this method, which is a pinion component.

Regarding claims 1-4, it would have been obvious to one of ordinary skill in steel metallurgy, at the time of the invention, to choose the instantly claimed ranges through process optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists." Badard discloses a steel with overlapping ranges of C, Mn, Si, S, P, Ni, Cr, Mo, Cu, Al, Nb, N,

Bi, Pb, Te, Se, Ca, and Fe along with a substantially identical processing method as explained above.

With respect to the Jominy test criteria specified in the claims, if the starting point is substantially identical composition which is subjected to substantially identical heat and thermomechanical treatments, then one of ordinary skill would reasonable expect identical structures and properties to be obtained and thus the average values of the five Jominy tests will thus necessarily be at the intervals claimed in claims 1 and 2. From MPEP 2112, V: "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on 'prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

***Response to Applicant's Arguments:***

3. Applicant's arguments filed July 13<sup>th</sup>, 2010 have been fully considered but they are not persuasive.

Applicants assert (p. 4, para 3) that the claimed steel compositions (i.e. curves E, F, and G) illustrate a lack of "significant inflection point", along with quasi-rectangular shape and gentle slope compared to reference steels outside the claimed steel

composition (curves A, B, C, and D) and show clear differences (p. 4, para 4) are compared to the reference steels, rising to the level of unexpected results (p. 5, para 4)

The beneficial results of the inventive steels as compared to the reference steels is asserted to be greatly reduced deformation during a quenching operation following a carburization operation (p. 5, para 1) and reduced carborizing time, increased carborizing depth, improved core hardness, improved energy at break, and increased fatigue properties (p. 5, para 2).

In response, the evidence submitted has not compared the claimed subject matter with the closest prior art of the actual Badard reference applied under 103(a). An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a *prima facie* case of obviousness (MPEP 716.02(e)). The closest example of Badard appears to be in Table 3, which discloses an alloy having 0.23 wt% C, 1.32 wt% Mn, 0.95 wt% Si, 1.11 wt% Cr, 0.10 wt% Mo, 0.032 wt% S, and 0.016 wt% P (balance Fe) and is implicitly carburized at between 950 to 1100 °C (claim 3).

Furthermore, looking at the composition table on p. 13 of the instant specification, in all cases when the reference (comparative) steels had alloying elements outside of the ranges of instant claim 1, they were always lower. Mn in ref A is low, Si in Refs A and B is low, Cr is Refs C and D is low, Mo is Refs A, B, and C is low, Nb is Ref A is low, and N in ref D is low. The issue is that "to establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range (MPEP 716.02(d),

section II). In this case, to demonstrate that the purported unexpected results occur over the entire range of claim 1, comparative examples having alloying elements present in amounts greater than claimed are needed to establish that the unexpected results apply up to the upper limits of the claimed ranges of instant claim 1. It is insufficient to simply show results of comparative examples with ranges lower than those claimed.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**-- Claims 1-4 are finally rejected**

**-- No claims are allowed**

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since



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other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588 and fax number is (571) 270-4588. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

**/Mark L. Shevin/**  
Examiner, Art Unit 1793

July 16<sup>th</sup>, 2010  
10-593,463

**/George Wyszomierski/**  
Primary Examiner  
Art Unit 1793